

## **REMARKS**

### **I. Introduction**

Claims 11, 12, 14 to 18, 20, and 22 are pending in the present application. In view of the foregoing amendments and the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

### **II. Objection to the Drawings**

As regards the objection to the drawings, while 37 C.F.R. § 1.83(a) requires the drawings to show every feature specified in the claims, it also provides that “conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be” -- but are not required to be -- “illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation.” The features of “the at least one of the reforming process and the fuel cell process,” a “glow plug,” and “the at least one nozzle includes one of a swirl nozzle and a multi-orifice nozzle” need not be illustrated since a detailed illustration thereof is not essential for a proper understanding of the claimed subject matter.

Regarding the feature of “the at least one of the reforming process and the fuel cell process,” it is respectfully submitted that one of ordinary skill in the art would understand that the feature refers to heat-conducting contact between the ceramic foam and the at least one of the reforming process and the fuel cell process via the combustion chamber. (See, e.g., Specification, p. 6, lines 28 to 30). Accordingly, a detailed illustration of the feature of “the at least one of the reforming process and the fuel cell process” is not essential for a proper understanding of the claimed subject matter.

Regarding the feature of a “glow plug,” it is respectfully submitted that this feature is illustrated schematically as denoted by reference numeral 14 in Figure 1. (See, e.g., Specification, p. 6, lines 18 to 23).

Regarding the feature of “the at least one nozzle includes one of a swirl nozzle and a multi-orifice nozzle,” it is respectfully submitted that one of ordinary skill in the art would understand these features, such that a detailed illustration is not essential for a proper understanding of the claimed subject matter.

It is respectfully submitted that those of ordinary skill in the art would properly understand the above features disclosed in the description and the claims, without need for further illustration.

In view of all of the foregoing, withdrawal of the objection to the drawings is respectfully requested.

### **III. Rejection of Claims 11, 12, 14 to 18, 20, and 22 Under 35 U.S.C. § 103(a)**

Claims 11, 12, 14 to 18, 20, and 22 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of U.S. Patent No. 6,003,305 (“Martin et al.”), U.S. Patent No. 6,077,620 (“Pettit”), and U.S. Patent Application Publication No. 2001/0028867 (“Shimoda et al.”). It is respectfully submitted that the combination of Martin et al., Pettit, and Shimoda et al. does not render unpatentable the presently pending claims for at least the following reasons.

In order for a claim to be rejected for obviousness under 35 U.S.C. § 103(a), the prior art must teach or suggest each element of the claim. See Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 934 (Fed. Cir. 1990), cert. denied, 111 S. Ct. 296 (1990); In re Bond, 910 F.2d 831, 834 (Fed. Cir. 1990). In addition, as clearly indicated by the Supreme Court, it is “important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed. See KSR Int’l Co. v. Teleflex, Inc., 127 S. Ct. 1727 (2007). Further, the Supreme Court in KSR noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. M.P.E.P. §2143.

Claim 11 relates to an afterburner for afterburning a residual gas from at least one of a reforming process and a fuel cell process, including, *inter alia*, at least one nozzle, at least one device for providing an air supply, a heat-resistant, open-pore ceramic foam for at least partially filling the combustion chamber, and an ignition device arranged as being one of installed in and formed integrally with the ceramic foam, in which *the ceramic foam is configured to conduct heat via a wall of the combustion chamber to the at least one of the reforming process and the fuel cell process*. Support for this amendment may be found in the Specification, e.g., at page 4, lines 27 to 30; and page 6, lines 28 to 30.

Martin et al. do not disclose, or even suggest, the feature that *the ceramic foam is configured to conduct heat via a wall of the combustion chamber to*

*the at least one of the reforming process and the fuel cell process*, as provided for in the context of claim 11, as presented. Instead, Martin et al. merely indicate a matrix 14a housed within shell 22a that includes an inner insulation layer 23 “for protecting shell 22a from high temperature and for thermal efficiency.” (col. 8, lines 62 to 65; and Figure 1 (emphasis added)). Thus, the shell 22a of Martin et al. is insulated from heat instead of conducting said heat. Moreover, nowhere do Martin et al. even refer to conducting heat from its matrix 14a via the shell 22a to any of a reforming process or a fuel cell process. Accordingly, Martin et al. do not disclose, or even suggest, all of the features included in claim 11.

In addition, Pettit also does not disclose, or even suggest, the feature that *the ceramic foam is configured to conduct heat via a wall of the combustion chamber to the at least one of the reforming process and the fuel cell process*, as provided for in the context of claim 11. Instead, Pettit merely indicates a combustor 56 including a housing 58 lined with two layers of insulating material 60 and 62. (Pettit, col. 3, lines 63 to 65; and Figure 2). Thus, the housing 58 of Pettit is insulated from heat instead of conducting said heat. Moreover, nowhere does Pettit even refer to conducting heat via housing 58 to any of a reforming process or a fuel cell process. Instead, Pettit explicitly states that “[t]he heat exchanger 30 [associated with a reformer 2] is heated from exhaust gases 32.” (col. 3, lines 36 to 37 (emphasis added)). Thus, the combustor 56 of Pettit plainly conducts heat only through exhaust gases, and not via a wall, or housing 58, of the combustor 56. Accordingly, Pettit does not disclose, or even suggest, all of the features included in claim 11.

Further, Shimoda et al. also do not disclose, or even suggest, the feature that *the ceramic foam is configured to conduct heat via a wall of the combustion chamber to the at least one of the reforming process and the fuel cell process*, and thus, fail to cure this critical deficiency. In this regard, Shimoda et al. merely indicate particular material combinations for an exhaust emission control device. (¶ [0010]). Therefore, Shimoda et al. also do not disclose, or even suggest, all of the features included in claim 11.

Accordingly, it is respectfully submitted that the combination of Martin et al., Pettit, and Shimoda et al. does not disclose, or even suggest, all of the features included in claim 11. Therefore, it is respectfully submitted that the

combination of Martin et al., Pettit, and Shimoda et al. does not render unpatentable the claim 11 for at least the foregoing reasons.

As for claims 12, 14 to 18, 20, and 22, which ultimately depend from claim 11 and therefore include all of the features included in claim 11, it is respectfully submitted that the combination of Martin et al., Pettit, and Shimoda et al. does not render unpatentable these dependent claims for at least the reasons more fully set forth above.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

#### **IV. Conclusion**

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

Dated: September 4, 2009

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